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43. The composition of claim 34 wherein said porogen comprises polypropylene glycol monobutyl ether.
- 5 44. A precursor for stable nanoporous film formation comprising said composition of claim 35.
45. A spin-on composition comprising said composition of claim 35.
46. A film comprising said spin-on composition of claim 45.
- 10 47. A stable nanoporous film comprising silicon polymer and a metal-ion-free catalyst selected from the group consisting of onium compounds and nucleophiles.
- 15 48. The stable nanoporous film of claim 47 wherein said film has an average pore size diameter of less than or equal to about 10 nanometers.
49. The stable nanoporous film of claim 47 wherein said film has an average pore size diameter of less than or equal to about 5 nanometers.
- 20 50. The stable nanoporous film of claim 47 wherein said metal-ion-free catalyst is tetramethylammonium acetate.
51. The stable nanoporous film of claim 47 wherein said silicon containing pre-polymer comprises a combination of acetoxy-based leaving groups.
- 25 52. The stable nanoporous film of claim 47 wherein said combination of acetoxy-based leaving groups comprises tetraacetoxy silane and methyltriacetoxy silane.

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53. A method of lowering the temperature at which a porous silica film forms comprising the step of adding onium ions or nucleophiles to a silicon-containing prepolymer and porogen.